

CONTRACT DOCUMENTS

**TOWN OF NORTH HAVEN,
CONNECTICUT**

**Drainage Improvements at Round Hill Rd.
Project #19-14**

October 2018

FINANCE

INVITATION TO BID TOWN OF NORTH HAVEN

Sealed bids from qualified contractors for drainage improvement work on Round Hill Road will be received at the Finance Office, Memorial Town Hall, 18 Church Street, North Haven, Connecticut, until November 15, 2018 at 10:30 am, at which time and place they will be opened and publicly read. Specifications may be obtained from the Finance Office. It is estimated that approximately 196 LF of 12" HDPE pipe, a precast storm manhole, a 12" HDPE flared end Section, paving, and site restoration will be needed. After bids are received the Director of Finance and Administration may analyze whether vendors have submitted comparable bids and meet the requirements called for. In reviewing the bids, the Director of Finance and Administration may consider the past performance, financial responsibility, and sales and service experience of the vendors. The Director of Finance and Administration reserves the right to reject any or all bids, to waive any defects in same, or to choose to make purchases other than strictly in accordance with price considerations, and/or to choose other than the lowest bidder, if it be deemed in the best interest of the Town of North Haven. **Bidders are advised hereby of the existence of an Ordinance concerning Bid Preference for Town-Based Businesses.**

Edward J. Swinkoski, C.P.A.
Director of Finance and Administration

BID Proposal

The undersigned _____, doing business in the City/Town of _____, submits herewith, in conformity with the general terms and conditions and specifications for the Town of North Haven Bid, Project 19-14 for the following proposal to pave streets in the Town of North Haven.

GENERAL DESCRIPTION

The Town of North Haven is soliciting bids from qualified Contractors to perform drainage improvements at Round Hill Road.

SCOPE OF WORK

The Scope of Work shall include, but not be limited to, the following:

Oakwood Drive and Elliot Court

1. Furnish & install approximately 200+/- LF of 12" HDPE
2. Furnish & install one 12" HDPE flared end section
3. Furnish & install one catch basin
4. Excavate & stabilize a 40+/- LF grass swale
5. Furnish & install bituminous trench patch at Town road and driveway
6. Perform site restoration including restoring disturbed lawn areas.

All work will be done in compliance with the attached specifications

COMPLETION OF WORK

The above Scope of Work, shall be completed no later than sixty (60) days after the award of the Contract. Extension of work related to Bid Alternates or changes in the bid shall be agreed upon by the Town of North Haven and the successful Bidder.

GENERAL INSTRUCTIONS TO BIDDERS

All Bid Proposals are to be:

- a. Submitted in duplicate unless otherwise indicated in the Bid Specification.
- b. Submitted using the proposal forms furnished with the Bid.
- c. Submitted in a sealed envelope with the Bidder's name and address in the upper left-hand corner of the envelope.
- d. Made out and signed in the corporate, or other, name of Bidder. In addition, an authorized person must fully and properly execute the bid.

Proposals received later than the time and date specified in the Invitation to Bid will not be considered. Amendments to, or withdrawal of proposals received later than the time and date set for the bid opening will not be considered.

Bidders or their representatives may be present at the bid opening.

The Town of North Haven may require further information and references on any individual or company placing a bid prior to the awarding of a bid.

The Director of Finance and Administration reserves the right to correct an award erroneously made as a result of a clerical error on the part of the Town of North Haven.

A contract shall not be awarded to any corporation, firm or individual that has an unpaid and overdue debt to the Town of North Haven by nonpayment of taxes, by debt or contract, or who is in the default as surety or otherwise by any obligation to the Town of North Haven.

BIDS MUST BE SUBMITTED ON THIS FORM

BID PRICE

Total Project Base Bid \$ _____

Total Base Bid Price \$ _____

Bids Submitted By:

Date:

Name of Firm

Telephone #

Fax #

Address

Printed Name

Title

City, State, Zip

Authorized Signature

ROUND HILL RD DRAINAGE

CONSTRUCTION SPECIFICATIONS

GENERAL CONDITIONS

INDEX TO GENERAL CONDITIONS

ARTICLE

TITLE

1. CONTRACT AND CONTRACT DOCUMENTS
2. DEFINITIONS
3. SCOPE OF WORK
4. INTERPRETATION OF PLANS AND SPECIFICATONS

GENERAL CONDITIONS

ARTICLE 1 **CONTRACT AND CONTRACT DOCUMENTS**

- (a) Wherever the words "Contract" or "Contract Documents" are used, they shall mean and include Drawings, Specifications and Addendum (or Addenda) enumerated in the Contract, the Advertisement for Bids, the Information for Bidders, and the Bid (Proposal) as accepted by the Owner and as evidenced by the Owner's Notice of Award to the Contractor, the Supplemental General Conditions, the General Conditions, the Special Conditions, the Technical Specifications and the Appendices, shall form parts of this Contract, and the provisions thereof shall be as binding upon the parties hereto as if they were herein fully set forth. The table of contents, titles, heading, running headlines and marginal references to various provision of the Contract Documents are in no way to affect, limit, or cast light upon the interpretation of the provisions to which they refer.
- (b) The Contractor hereby agrees to commence work under this Contract on or before a date to be specified in a written "Notice to Proceed" from the Owner and to fully complete the project within 60 (sixty) consecutive calendar days thereafter. The Contractor further agrees to pay, as liquidated damages, the sum of \$250.00 (two-hundred fifty) for each consecutive calendar day thereafter as hereinafter provided in the Contract and General Conditions.

ARTICLE 2 **DEFINITIONS:**

- (a) The word "Municipality" as used in the Contract Documents or in discussions concerning or appertaining to the work as a whole, shall mean the Town of North Haven, Connecticut. The words "Town" or "Owner", when used, shall also mean the Town of North Haven, Connecticut, acting herein through its First Selectman and/or Engineer.
- (b) Whenever the words "Governing Body" are used in the Contract Document, they shall mean the Town of North Haven, Connecticut.
- (c) Whenever the word "Engineer" is used in reference to the work or any part thereof or in the Contract Documents, it shall mean the Town Engineer.
- (d) Whenever the word "Inspector" is used in the Contract Documents, it shall mean such a person or persons engaged by the Town of North Haven to make inspections of the work performed and materials furnished by the Contractor.
- (e) Whenever the word "Bidder" is used in the Contract Documents, it shall mean any individual, partnership, firm or corporation submitting an approved proposal for the work contemplated.
- (f) Whenever the word "Contractor" is used, it shall mean the person or persons or co-partnership or corporation contracted to perform the work to be done under the Contract Documents or the legal representative of such party or parties.

ARTICLE 2 cont'd**DEFINITIONS:**

- (g) Whenever the word "Subcontractor" is used in the Contract Documents, it shall mean the person, firm or corporation supplying labor and materials or only labor for work at the site of the project for and under separate contract or agreement with the Contractor.
- (h) Whenever the word "Surety" is used in the Contract Documents, it shall mean the corporate body which is Surety on the Contractor's bond for the payment of all debts for materials and labor used or employed in the execution of the contract and for the acceptable performance of the work.
- (i) Whenever the words "Town Attorney" are used, they shall mean the Town Attorney of the Town of North Haven, Connecticut.
- (j) Whenever the word "Bid" is used in the Contract Documents, it shall mean the proposal submitted by the bidder and similarly the "Proposal" shall be bid.
- (k) Whenever the word "Plans" is used in the Contract Documents, it shall mean the drawings or reproductions of drawings pertaining to the construction of the work or to any structure connected therewith. The word "Drawings" may sometimes be used and it shall be understood to mean "Plans".
- (l) Whenever the word "Specifications" is used in the Contract Documents, it shall mean the description, directions, provisions and requirements contained in the Contract Documents, together with all written agreements made or to be made pertaining to the method and manner of performing the work or to the quantities and qualities of materials to be furnished under this contract.
- (m) Whenever the word "Addendum" is used in the Contract Documents, it shall mean any written interpretation, clarification, amendment or addition to the Plans or Specifications issued by the Town Engineer.
- (n) Whenever the word "Project" is used, it shall mean the entire work to be executed under the contract.
- (o) Whenever the word "Contract" is used in the Contract Documents, it shall mean the contract covering the performance of the work and the furnishing of materials required therefore as evidenced by the Contract Documents.
- (p) Whenever the phrases "substantial completion" or "substantially complete" are used in the Contract Documents, they shall mean the completion of construction of all installations, completely tested and accepted and being sufficiently completed so that the project or specified part can be used for the purposes for which it is intended.
- (q) The figures shown on the plans after the word "elevation" or abbreviation of it, shall mean the distance in feet above the datum adopted by the Engineer.

ARTICLE 3**SCOPE OF WORK:**

- (a) The Contractor shall furnish all labor, materials, equipment, plant, power, water, light, heat, fuel, tools, appliances, supplies and all other means of construction necessary or proper for executing and completing the project; he shall do all work including extra and additional work and pay all costs connected therewith; restore to their original conditions all surfaces disturbed; pay cost of all insurance; bear all losses due to the nature of the work and costs incidental to suspension or discontinuance of the work except as otherwise provided; assume all responsibility of whatever nature of kind, indemnify the Owner from all claims; secure and pay for all permits unless otherwise provided; conform to all county, state, municipal or federal legislation and requirements; he shall do all work necessary to conform the project to the Contract Documents and shall leave intact the work of any adjoining contractors unless otherwise ordered by the Owner; perform and complete the work in a manner best calculated to permit rapid construction, consistent with safety of a life and property and satisfactory to the Owner and in strict accordance with the Contract Documents; he shall protect the work during construction, clean up the work during and after construction and maintain it until final acceptance, as hereinafter provided.
- (b) The Contractor shall do all work and pay all costs of protecting, supporting, maintaining, repairing if damaged, relocating and restoring all surface, subsurface or overhead structures and all other property including pipes, conduits, ducts, tubes, chambers and appurtenances, public or private, in the vicinity of the work, except as otherwise specified.

ARTICLE 4**INTERPRETATION OF PLANS & SPECIFICATIONS:**

The Contractor will be furnished with three sets of plans and specifications giving all the details and dimensions necessary for carrying out the work. One copy of the plans and specifications furnished to the Contractor must be kept constantly on the site. Anything shown on the plans and not mentioned in the specifications or mentioned in the specifications and not shown on the plans and all work and materials necessary for the completion of the work according to the intent and meaning of the Contract Documents shall be furnished, performed and done, as if the same were both mentioned in the specifications and shown on the drawings. Any conflict or inconsistency between the plans and specifications or any discrepancy between the figures and scale of drawings shall be submitted by the Contractor to the Engineer, whose decision thereon shall be conclusive.

In the event the meaning of any portion of the specifications or drawings or any supplementary drawings or instructions of the Engineer is doubtful, the best type of construction, both as to materials and workmanship, which reasonably can be interpreted is to be implemented. All materials and workmanship must be strictly in accordance with the specifications. The plans show the approximate size, arrangement and location of the proposed work. During construction, the Engineer will designate exact lines and grades, shapes and dimensions and the Contractor shall construct the work exactly in accordance with such instructions of the Engineer.

ROUND HILL RD DRAINAGE
CONSTRUCTION SPECIFICATIONS

SPECIAL CONDITIONS

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SPECIAL CONDITIONS

ARTICLE 1 **SCOPE OF WORK:**

The Contractor shall furnish all plant, labor, materials, supplies, equipment and other facilities and services necessary or proper for or incidental to the work contemplated by this contract as required by and in strict accordance with the drawings, specifications and addendum (or addenda), and/or required by and in strict accordance with such changes as are ordered and approved pursuant to this contract, and the Contractor shall perform all other obligations imposed on him by this contract. The Contractor shall be responsible for all materials delivered and work performed until completion and final acceptance. Upon completion of the contract, the project shall be presented, complete and undamaged.

ARTICLE 2 **PROVISIONS FOR FLOW OF PRESENT DRAINAGE:**

Provision for the flow of all sewers, drains and water courses that are met or altered during construction shall be provided by the Contractor and all the connections shall be restored without extra charge. All offensive matter shall be removed immediately with such precautions as may be required. If required, the Contractor shall install temporary bypass connections for surface or pipe drainage facilities to provide uninterrupted or continuous service during the time of construction. Whenever and wherever a temporary bypass is provided, an alternate means of bypass shall also be provided. The alternate bypass shall insure the continued flow of drainage in the event of failure of the initial bypass. Both methods of bypass shall be approved by the Owner and shall be provided by the Contractor at no additional expense to the Owner.

ARTICLE 3 **WORK TO BE ACCOMPLISHED IN ACCORDANCE WITH THE DRAWINGS & SPECIFICATIONS:**

The work, during its progress and at its completion, shall conform to the lines and grades shown on the drawings and to the directions given by the Owner from time to time, subject to such modifications or additions as he shall determine to be necessary during the execution of the work; and in no case will any work be paid for which is performed in excess of such requirements. The work shall also be accomplished in accordance with the data pertaining to these specifications.

ARTICLE 4 **CONTRACTOR TO CHECK DIMENSIONS & SCHEDULES:**

The Contractor will be required to check all dimensions and quantities shown on the drawings or schedules given to him by the Owner, and shall notify the Owner of all errors therein which he may discover by examining and checking the same. The Contractor shall not take advantage of any error or omission in these specifications, drawings and schedules. The Owner will furnish all instructions should such error or omission be discovered, and the Contractor shall carry out such instructions as if originally specified.

ARTICLE 5 **PROTECTION OF TREES:**

The Contractor shall take special care to preserve and protect from injury all trees located along the lines of construction, and no such trees shall be cut down, trimmed or otherwise cut without permission from the Owner.

ARTICLE 6 **HURRICANE PROTECTION:**

Should hurricane warnings be issued, the Contractor shall take every practicable precaution to minimize danger to person, to the work and to adjacent property. These precautions shall include closing all openings; removing all loose materials, tools and/or equipment from exposed locations; and removing or securing scaffolding and other temporary work.

ARTICLE 7 **FIRST AID TO INJURED:**

The Contractor shall provide arrangements for the immediate removal and hospital treatment of any employee injured on the project who may require the same.

ARTICLE 8 **CONFORMANCE WITH DIRECTIONS:**

The Owner may make alterations in the lines, grade, plan, form, dimensions or materials to be used in project or any part thereof, either before or after the commencement of construction.

ARTICLE 9 **PROTECTION AGAINST HIGH WATER AND STORMS:**

- (a) The Contractor shall take all precautions to prevent damage to the work or equipment by high water or by storms. The Owner may prohibit the carrying out of any work at any time when in his judgment, high water or storm conditions are unfavorable or not suitable, or at any time, regardless of the weather, when proper precautions are not being taken to safeguard previously constructed work or work in progress. No claim by the Contractor shall be made for lost time as a result of such shut down by the Owner.
- (b) In case of damage caused by the failure of the Contractor to take adequate precautions, the Contractor shall repair or replace equipment damaged and shall make such repairs or rebuild such parts of the damaged work, as the Owner may require, at no additional expense to the Owner.

ARTICLE 10 **COMPETENT HELP TO BE EMPLOYED:**

The Contractor shall be required to prosecute his work in accordance with a schedule prepared by him in advance in accordance with additional requirements specified herein and approved by the Owner. This schedule shall state the methods and shall forecast the times for doing each portion of the work. Before beginning any portion of the work, the Contractor shall give the Owner advance notice and ample time for making the necessary preparations.

ARTICLE 11 **SEQUENCE OF WORK:**

The Contractor shall employ experienced foremen, craftsmen and other workers competent in the work in which they are to be engaged. All work shall be accomplished by able, skilled and competent personnel. If any person employed on the work by the Contractor shall appear to be incompetent or unreliable in any way, he shall be discharged immediately upon the request of the Owner and shall not again be employed on the work.

ARTICLE 14 **WORK OUTSIDE REGULAR HOURS:**

Night work or work on Saturdays, Sundays or legal holidays requiring the presence of an Engineer or Inspector, will not be permissible except in case of emergency, and only upon the approval of the Owner.

ARTICLE 17 **BLASTING AND EXPLOSIVES:**

(a) **Blasting Precautions:**

- (1) Blasting shall be conducted with all possible care in order to avoid injury to persons and property. The blasting area shall be well-covered and a sufficient warning shall be given to all persons in the vicinity of the work before blasting.
- (2) The explosives used shall be of such power and placed in such quantities and positions that will not make the excavation unduly large nor shatter unduly the rock upon or against which the work is to be installed nor injure the work already in place. Where masonry is to be built against the rock, all loose or shattered rock shall be completely removed so the masonry can be built firmly in contact with the solid rock.
- (3) The Contractor's attention is directed to the fact of the proximity of gas lines, water lines and telephone ducts. Extreme caution must be utilized so as not to damage or disrupt these utilities. Any damage or disruption costs resulting from blasting shall be borne by the Contractor.

- (b) Explosives must be carefully transported, stored, handled and used as required by Federal Laws (occupational Safety and Health Act) the several local and State ordinances and laws, and the necessary permits for such transportation, storage, handling and use shall be obtained by the Contractor who shall show such permits to the Owner before any blasting will be allowed. The Contractor shall keep on the job only such quantity of explosives as may be needed for the work underway and only during such time as they are being used. Explosives shall be stored in a secure manner and separately from all tools. Caps or detonators shall be stored separately and at a point over 100 feet distant from the explosives. Receptacles especially constructed for use in the storage of explosives shall be provided for the storage of explosives and they shall be proof against bullets, fire or other conditions which might cause explosion of the contents. When the need for explosives ceases, all such material remaining on the job shall be promptly removed from the premises.

ARTICLE 17 cont'd

- (c) Under any circumstances, the approval of the Owner shall first be obtained before blasting is permitted and where, in the opinion of the Owner, blasting is unsafe or dangerous to persons or to existing structures and utilities, the Contractor shall employ pneumatic tools, drilling and splitting mechanically or by hand or by other means not requiring the use of explosives for the removal of rock, boulders or ledge, at no additional expense to the Owner.
- (d) Before any explosives, such as dynamite or detonator caps, are stored or used at the site or sites of construction under this contract, the Contractor shall contract the Fire Department of the Town of North Haven, for instructions relative to the regulations for possession and use of explosives in the Town of North Haven, Connecticut. The Contractor shall obtain all required permits or licenses for possession and use of explosives on the site or sites of construction under this contract. In addition, the Contractor shall be responsible:
 - (1) To provide a man who shall be responsible for the explosive materials at all times;
 - (2) For the keeping of records which shall show by date the explosive materials delivered to the site or sites of construction, the explosive materials used for construction and the explosive materials removed from the site or sites of construction under this contract;
 - (3) For the non-storage of explosive materials overnight on the site or sites of construction under this contract;
 - (4) For the immediate reporting to the Fire Department of the Town of North Haven of all unaccounted-for explosive materials.
- (e) All records relating to the possession and use of explosive materials under this contract shall be open to inspection by the Police and Fire Departments of the Town of North Haven, at any time.
- (f) The use of explosives on State-owned and privately-owned properties shall be subject to all additional requirements as may be required by the above-mentioned property owners.
- (g) In addition to other requirements specified and all other necessary or required precautionary measures, the Contractor shall be held responsible for completely, adequately and carefully covering all blasts with suitable blasting mats in such a manner as to prevent damage to landscape features, structures, utilities or other surrounding objects and in a manner that will prevent injury to persons.
- (h) The use of the maximum number of drill holes, together with minimum quantities of explosives in each drill hole and utilizing split-second delayed caps is the preferable method of accomplishing the blasting operations in conjunction with rock excavation.

ARTICLE 17 cont'd

- (i) The Contractor shall keep blasting logs of all his blasting operations. The blasting logs shall include all pertinent information with respect to the blasting operations including personnel, times, locations, description of charges, methods, details of blasting patterns and excavations, and such other information as may be required. The Contractor shall furnish to the Owner each day, in which blasting operations are performed, certified copies of the Contractor's blasting logs covering all of his blasting operations.
- (j) Unless specifically permitted, no blasting shall be done between the hours of sunset and sunrise on any day and no blasting will be allowed on Sundays or legal holidays.
- (k) In the event that any provisions in this Article 17 are contrary to or inconsistent with the above referred to Occupational Safety and Health Act, provisions of the Occupational Safety and Health Act shall prevail.

ARTICLE 18 TUNNELING NOT PERMITTED:

Tunneling will not be permitted without the consent of the Owner.

**ARTICLE 20 DISPOSAL OF MATERIALS, ACCESS TO HYDRANTS &
GATES, & MATERIALS TRIMMED-UP FOR CONVENIENCE
OF PUBLIC TRAVEL OR ADJOINING TENANTS:**

The materials from the trenches and excavations and those used in the construction of the work shall be deposited in such a manner so they will not endanger persons or the work, and so that free access may be had at any time to all hydrants and gates in the vicinity of the work. The materials shall be kept trimmed-up so as to be of as little inconvenience as possible to the public travel or the adjoining tenants. All excavated materials not approved for backfill and fill, all surplus material and all rock and boulders resulting from the excavations shall be removed and satisfactorily disposed of off the site by the Contractor at no additional expense to the Owner.

ARTICLE 24 TURF, TOPSOIL & OTHER REPLACED ITEMS:

Where the drainage system is constructed through cultivated or sodded lands, the Contractor shall stockpile the turf and topsoil separately and replace the same after the trench is filled, leaving the land as nearly as possible to its original condition. Trees, fences, walls, walks and such other items must not be damaged.

ARTICLE 25 MATERIALS:

All materials furnished and used in the completed work shall be new, of best quality workmanship and design and recognized as standard in good construction practices. Whenever a specification number or reference is given, the subsequent amendments (if any) shall be included. The standards set forth in the selection of materials and supplies and intended to conform to those standards adopted by the Owner. Preference in manufacture shall be given to adopted standards and the Contractor shall further familiarize himself with the requirements of the Owner when the occasion or choice of materials of supplies so demands.

ARTICLE 26 DEFECTIVE MATERIALS, INSPECTION & TESTING OF MATERIALS FURNISHED, SAMPLES & ORDERING LISTS:

- (a) No materials shall be laid or used which are known, or may be found to be in any way defective. Notice shall be given to the Owner of any defective or imperfect material. Defective or unfit material found to have been laid shall be removed and replaced by the Contractor with sound and unobjectionable material without additional expense to the Owner.
- (b) All materials furnished by the Contractor are subject to thorough inspections and tests by the Owner.

ARTICLE 30 SPIRITUOUS LIQUORS:

The Contractor shall neither permit nor suffer the introduction or use of spirituous liquors, dope or drugs of any kind or description unless ordered by a physician upon the work embraced in this contract.

ARTICLE 31 FINISHING & CLEANING UP:

In completing the backfilling of the trenches, the Contractor shall replace all surface material to the satisfaction of the Owner, and shall then immediately remove all surplus material, and all tools and other property belonging to him, leaving the entire street or surroundings free and clean and in good order, at no additional expense to the Owner. The backfilling and removing of surplus materials shall follow closely upon the completion of the work. The Contractor shall exercise special care in keeping rights-of-way and private and public lands, upon which work is to be performed, clean and free of debris at all times and to remove tools and other property belonging to the Contractor when they are not being used.

ARTICLE 32 CLEAN-UP AT CONTRACTOR'S EXPENSE:

In case the Contractor shall fail or neglect, after backfilling, to promptly remove all surplus materials, tools and other incidentals, or promptly do the required repaving when ordered, the Owner may, after 24 (twenty-four) hours notice, cause the work to be done and the cost thereof shall be deducted from any monies then or thereafter due the Contractor.

ARTICLE 33 **RIGHTS OF ACCESS:**

Nothing herein contained or shown on the drawings shall be construed as giving the Contractor exclusive occupancy of the work areas involved. The Owner or any other Contractor employed by him, the various utility companies, Contractors or subcontractors employed by the Federal, State or local government agencies or other utility firms or agencies involved in the general project or upon public rights-of-way, may enter upon or cross the area of work or occupy portions of it as directed or permitted.

ARTICLE 34 **WORK WITHIN THE LIMITS OF PRIVATE PROPERTY:**

- (a) Particular attention is hereby directed to the fact that some of the work included under this contract may have to be done within the limits of properties that are State-owned and privately owned. The Owner has, or will, secure the necessary limited temporary or permanent easements for construction purposes. The Contractor will be permitted to use the areas of the Owner's easements, subject to all conditions and requirements as they may effect the Contractor's operations and the work of this contract and the Contractor shall conduct his operations and activities in the performance of the work under this contract in accordance with all such conditions and requirements as may be imposed by the Owner.
All means and rights of ingress and egress to the work areas and all areas required for work space shall be the entire responsibility of the Contractor and all costs in connection therewith shall be considered to be included in the price as listed in the bid; the Contractor shall not use nor occupy public or private lands outside the limits of the Owner's easements and rights-of-way unless permits in writing have first been obtained by the Contractor from the owners of the public and/or private land and copies of such permits filed with the Owner. The Contractor shall be responsible for cooperating with and for coordinating the prosecution of the work of this contract with State and private property owners. Any abuse to lands of State or private owners shall be immediately corrected by the Contractor at his expense to the complete satisfaction of the owners and such precautionary or preventive measures as required by the Owner shall be taken or made to prevent further additional nuisances, interference or inconvenience to the abutting owners.
- (b) It shall be the Contractor's full responsibility to familiarize himself with the limitations imposed on the work of construction within the various properties of State or private ownership and rights-of-way by the existing occupancy or use. To this end, he will be required to make every effort to fully and satisfactorily protect trees, shrubs, lawns, gardens, fences, walks, driveways, structures and all and any other appurtenances of the property owners. In addition, he shall provide adequate access to all walks, driveways, yards or structures; protect all work by the erection of placing of safety guards or barriers, lights and such other incidentals; and where required, the Contractor shall construct temporary plank crossings or timbers to permit full use of private facilities at all times, at no additional expense to the Owner. All other applicable provisions for control of work within the areas of public travel set forth elsewhere herein shall also apply to work within the limits of private ownership.

ARTICLE 34 cont'd

- (c) The Contractor shall cooperate with State and private property owners and shall also contact the Owner for additional information regarding the requested (or required) length of time needed as a notice to be given to the State and private property owners before the Contractor enters the State or privately owned property in order to start the work and a certain limited length of time may be required by the State and private property owners for any shutdowns or construction operations so the work of the Contractor will not interfere with the operations of the State or private property owners.
- (d) Before proceeding with construction operations the Contractor shall provide suitable and substantial gates or other approved forms of closing gap device in every fence within the limits of the Owner's easements and through which the Contractor intends to move or pass equipment and materials. It shall be the responsibility of the Contractor to negotiate with the owner of each fence all requirements, in addition to those specified above, relating to the construction of gates or other form of gap, closing device, conditions to be observed in their use and for the rebuilding of fences. It shall be the responsibility of the Contractor to comply with all requirements as specified herein and as agreed to with the owners of the fences, and any damage to fences as a result of the Contractor's operations shall be made good by the Contractor in a manner satisfactory to the Owner.
- (e) No separate payment will be made for the requirements specified under "WORK WITHIN THE LIMITS OF PRIVATE PROPERTY" and all costs in connection therewith shall be included in the price listed in the bid.

ARTICLE 35 LOADING:

No part of the structures involved in this contract shall be loaded during construction with a load greater than is calculated to carry with safety. Should any accidents or damage occur through any violation of this requirement, the Contractor will be held responsible under his contract and bond.

ARTICLE 36 EXISTING UTILITIES OR CONNECTIONS:

- (a) The location of existing underground pipes, conduits and structures as shown has been collected from the best available sources and the Owner together with its agents does not imply nor guarantee the data and information in connection with underground pipes, conduits, structures and such other parts as to their completeness nor their locations as indicated. The Contractor shall assume that there are existing water, gas and other utility connections to each and every building enroute, whether they appear on the drawings or not. Any expense and/or delay occasioned by utilities and structures or damage thereto, including those not shown, shall be the responsibility of the Contractor, at no additional expense to the Owner. The contractor shall have no claims to the Owner or Engineer for utility location accuracy presented.

ARTICLE 36 cont'd

- (b) Before proceeding with construction operations, the Contractor shall make such supplemental investigations, including exploratory excavations, by hand digging, as he deems necessary to uncover and determine the exact locations of utilities and structures and shall have no claims for damages due to encountering subsurface structures or utilities in locations other than shown on the drawings. The Contractor shall be responsible and liable for all damages to the existing utilities and structures.

ARTICLE 38 COMPLETENESS OF WORK:

In addition to the specified or described portions, all other work and all other materials, equipment and labor of whatever description which are necessary or required to complete the work, or for carrying out the full intent of the drawings and specifications, as interpreted by the Owner, such work, labor, materials and equipment shall be provided by the Contractor, and payment therefor shall be considered as having been included in the price listed in the bid.

ARTICLE 40 CLEANING FINISHED WORK:

After the work is completed, the drainage pipes, manholes and structures shall be carefully cleaned free of dirt, broken masonry, mortar, construction and other debris and left in first class condition ready for use. All temporary or excess material shall be disposed of and the work left broom-clean to the satisfaction of the Owner.

ARTICLE 41 DUST CONTROL:

The Contractor shall exercise every precaution and means to prevent and control dust arising out of all construction operations from becoming a nuisance to abutting property owners or surrounding neighborhoods. Pavements adjoining the pipe trenches shall be kept broomed off and washed clean of excess trench material wherever and whenever directed. Earth piles along trenches, earth stockpiles and surfaces of refilled trenches shall be kept moist at all times, as directed. No extra payment will be made for providing the dust control measures and conforming to the requirements specified above, but compensation therefor shall be considered to be included in the prices stipulated for the appropriate items of work as listed in the bid.

ARTICLE 42 CARE OF THE WORK:

The Contractor shall be responsible for all damages to persons or property that occur as a result of his fault or negligence in connection with the prosecution of the work and shall be responsible for the proper care and protection of all material delivered and work performed until completion and final acceptance, whether or not the same has been covered by partial payments made by the Owner.

ARTICLE 43 **INDEMNITY OF OWNER BY CONTRACTOR:**

The Contractor shall indemnify and save harmless the Owner and the Engineers and their officers, agents, and employees, against any and all damages to property or injuries to or death of any person or persons including property or injuries to or agents of the Owner, and the Engineers, and shall defend, indemnify and save harmless the Owner and the Engineers and their officers, agents and employees from any and all claims, demands, suits, actions or proceedings of any kind or nature including worker's compensation claims, of or by anyone whomsoever, in any way resulting from or arising out of the operations in connection herewith, including operations of Subcontractor and acts or omissions of employees or agents of the Contractor or his Subcontractor. Insurance coverage specified herein and in any special conditions constitutes the minimum requirements and said requirements shall in no way lessen or limit the liability of the Contractor under the terms of the contract. The Contractor shall procure and maintain, at his own cost and expense, any additional kinds and amounts of insurance which, may be necessary for his proper protection of other utilities in the prosecution of the work. The Contractor agrees to well and truly save and indemnify and keep harmless, the Owner, the Engineers, their agents and employees against all liability, judgments, costs and expenses which may in anyway result from carelessness, omission or neglect of the Contractor or his agents, employees or workmen in any way arising or resulting from the operation in connection herewith, including all liability to the Owner resulting from the failure to erect and maintain sufficient railing or fence as required by Section 13a-149, Connecticut General Statutes, and against all liability from defects claimed to be in violation of Section 13a-149, Connecticut General Statutes. Any additional cost of this save harmless insurance coverage shall be included in the price of this Contract.

ARTICLE 53 **MATERIAL & WORKMANSHIP:**

All workmanship, equipment, material and articles incorporated in the work covered by this contract are to be of the best grade of their respective kinds for the purpose. The Contractor shall furnish to the Owner for his approval the name of the manufacturer of said products. When required by the specifications, or when called for by the Owner, the Contractor shall furnish the required information for approval of all the material or articles which he contemplates incorporating in the work. Samples of material shall be submitted for approval when and as directed. Said material and articles installed or used without such approval shall be at the risk of subsequent rejection.

ARTICLE 63 EROSION & SEDIMENTATION CONTROLS:

- (a) In order to reduce the affect of locating the construction activity across natural surface runoff and groundwater movement from high ground to the stream, the Contractor shall adhere to the following restrictions:
1. Construction shall be phased so that no more than 75'± (seventy-five) trench will be open at a single time. Backfilling will take place as soon as the pipe is in place.
 2. As soon as backfilling and settlement have taken place, the area will be restored and seeded with temporary or permanent vegetation cover as appropriate.
 3. Both the suitable materials stockpiled and the parallel work road will be located so the upland side (away from the Brook) of the active trench so that any sediment transport will go into the open trench rather than to the stream. Wherever feasible, a continuous linear silt fence will be placed between the work area and the Brook as an additional protective measure.
 4. Topsoils will be stockpiled separately from backfill materials (both on the high side of the trench). Upon completion of backfilling operations, the topsoil will be placed over the trench in order to enhance growth of both temporary and permanent vegetation cover. Stockpile areas will be restored to their previous condition prior to full project completion by grading and reseeding.
 5. Wherever feasible, dewatering will be kept to a minimum by utilizing continuous interlocking sheathing. Where dewatering is necessary, the pumps will not be allowed to discharge directly to the Brook. A nearby vegetated swale will be selected and diked by silt fences as required to provide a natural sedimentation basin. In lieu of this and as a last resort temporary sedimentation basins will be constructed to receive the sediment laden pumped water. Regardless of the method used, wetland and water course elevations shall be restored and channels cleaned and cleared of construction debris and excess excavated sediment. All affected areas shall be restored to their original condition.
 6. The Contractor shall be completely responsible for undertaking all the measures necessary to prevent erosion and siltation and the restoration of the area to its natural condition.

ROUND HILL RD DRAINAGE

CONSTRUCTION SPECIFICATIONS

TECHNICAL SPECIFICATIONS

SECTION 01562

CALCIUM CHLORIDE

Part 1 General

1.01 SCOPE OF THE WORK

- A. The Contractor shall provide all equipment, labor, materials and related work necessary for the prevention and control of dust resulting from his operations in the performance of the work of this contract and in accordance with additional requirements specified herein under paragraph entitled "DUST CONTROL" in the SPECIAL CONDITIONS: all costs in connection therewith shall be considered included in the various unit and/or lump sum prices bid for the various items of work as listed in the bid.
- B. The work and materials required by this section of the Specifications consist of the furnishing of all plant, labor, equipment, appliances and materials and in performing all operations in connection with providing calcium chloride for supplementary dust control purposes over the areas and appurtenant work, complete, in accordance with the specifications and as directed.

Part 2 Products

2.01 MATERIALS

Calcium chloride shall meet the requirements of ASTM Designation: D 98, latest revision, Type I.

Part 3 Execution

3.01 GENERAL

The Contractor shall provide all equipment, labor, materials and related work necessary for prevention and control of dust resulting from his operation in the performance of the work of this contract and in accordance with additional requirements specified herein.

3.02 WORKMANSHIP

When in the opinion of the Owner, conditions at the site require dust control measures to supplement those required to be provided by the Contractor as described in paragraph 1.01A, the Owner may direct the Contractor to furnish and spread calcium chloride over certain areas at the site, at certain times and at specific rates of application. The calcium chloride shall be spread over the designated areas by approved mechanical devices at the rate for each area as directed.

SECTION 01563

DEWATERING, CONTROL & DIVERSION OF WATER

Part 1 General

1.01 SCOPE OF THE WORK

The work and materials required by this section of the Specifications consist of the furnishing of all labor, equipment, tools and materials and performing all operations in connection with the dewatering, control and diversion of water and all other operations necessary to maintain "in the dry" conditions of all excavations and work areas of this contract. The Contractor shall be responsible for providing, maintaining, operating and removing all dewatering and other facilities, including all pumping and appurtenant equipment required to maintain in a dry condition the areas in which construction of this contract is to be conducted. The Contractor shall be responsible for performing all required dewatering in a manner to prevent injury to persons or public health and damage to existing facilities or public health and damage to existing facilities or the work in progress.

Part 2 Products

2.01 MATERIALS

The Contractor shall provide all pumps, drains, well points, cofferdams or any facility necessary for the control, collection and disposal of all surface and subsurface water encountered in the performance of the contract work.

Part 3 Execution

3.01 GENERAL

- A. The excavations for work required under this contract are to some extent below existing ground water levels. The Contractor shall operate and maintain all pumps, drains, well points or any facility necessary for the control, collection and disposal of all surface and subsurface water encountered in the performance of the contract work. All excavations shall be kept dry at all times and all construction work shall be performed in the dry, unless otherwise authorized or directed by the Owner.
- B. Any damage to existing facilities or new work resulting from the failure of the Contractor to maintain the work areas in a dry condition shall be repaired by the Contractor, as directed by the Owner, at no additional expense to the Owner. Pumping shall be continuous where specified or directed or as necessary to protect the work and to maintain satisfactory progress.
- C. Where cofferdams are necessary so that the work may be performed in the dry, the Contractor shall design, furnish, install, maintain and remove all such cofferdam facilities. Cofferdams shall be designed to withstand all imposed loads and to prevent injury to persons or damages to existing structures and property and to the work.

3.02 WORKMANSHIP

- A. The Contractor's pumping and dewatering operations shall be carried out in such a manner that no loss of ground will occur. All pipelines or structures not stable against uplift during construction or prior to completion shall be thoroughly braced or otherwise protected against movement or damage.
- B. Water being disposed of by the pumping and dewatering operations shall be disposed of in such a manner to avoid pollution of existing water courses, injury to persons or public or private property or to the work completed or in progress. Dewatering shall be accomplished by approved methods which have a background record of successful dewatering of similar excavations and subsurface conditions expected to be encountered in the work.
- C. Cofferdams shall be installed to sufficient depths to allow a reasonable depth of below-grade excavation below the work to be constructed. They shall be as watertight as necessary for the construction of the work in the dry. They shall be of such dimensions as to give sufficient clearance for construction and inspection of the work and to permit installation of all necessary dewatering facilities.
- D. The Contractor shall be solely responsible for the design, construction, adequacy and safety of all cofferdam facilities and for any injury or damage caused by the installation or failure of the cofferdam facilities. Cofferdams, including all sheeting and bracing required, shall be removed by the Contractor after completion of the permanent construction unless otherwise directed by the Owner.
- E. The Contractor shall be responsible for providing and maintaining all ditching, grading, sheeting and bracing, pumping and appurtenant work for the temporary diversion of water courses and protection from flooding as necessary to permit the construction of work in the dry.
- F. Upon completion of the contract work in each construction area, the Contractor shall remove all temporary construction and shall do all necessary earthwork and grading to restore the areas disturbed to their original condition or to such other conditions as indicted or directed by the Owner.
- G. Water shall not be permitted to flow into or through excavations in which work is under way or has been partially completed. The Contractor shall not restrict or close off the natural flow of water in such a way that ponding or flooding will occur and shall at all times prevent flooding of public and private property. All damages resulting from flooding or restriction of flows shall be the sole responsibility of the Contractor , at no additional expense to the Owner.
- H. The Contractor's pumping and dewatering operations shall be carried out in such a manner that the ground water table in nearby private water supply wells is uneffected. Any damages resulting from the lowering of the ground water table or the drying up of these wells shall be the sole responsibility of the Contractor, at no additional expense to the Owner.

END OF SECTION

SECTION 02110

CLEARING & GRUBBING

Part 1 General

1.01 SCOPE OF THE WORK

- A. The extent of work shall be as shown on the drawings and as indicated within this section, and includes the furnishing of all labor, equipment, tools and materials to accomplish the work completely for approval.
- B. The work and materials required by this section of the Specifications consist of the following:
 - 1. Clearing, grubbing and the preparation of the site within the limits of construction shown on the drawings.
 - 2. Disposal off-site of all materials from the clearing and grubbing operations not designated to remain.

Part 2 Products (not applicable)

Part 3 Execution

3.01 GENERAL

- A. Clearing shall include the felling and cutting up of all trees and the satisfactory removal and disposal of trees, downed timber, brush and debris and obstructions of any nature. Individual trees directed to be left standing shall be protected in a satisfactory manner to prevent damage incident to construction operations. The Contractor shall take special care to preserve and protect from injury all trees located along the lines of construction, and no such trees shall be cut down, trimmed or otherwise cut without permission from the Owner.
- B. Grubbing shall include the satisfactory removal and disposal of all stumps, roots larger than one inch in diameter, matted roots, debris, surface boulders and other obstructions to a depth not less than 18 (eighteen) inches below finish ground grades, except that in areas to be occupied by structures they shall be removed in their entirety. In areas to be occupied by embankment, they may be removed to a depth not less than 12 (twelve) inches below existing ground. All depressions resulting from grubbing shall be refilled with selected materials from earth excavation, graded and compacted so as to conform to adjacent ground surfaces.

3.02 DISPOSAL OF CLEARED & GRUBBED MATERIALS

All timber, stumps, roots, brush and other debris, obstructions, and objectionable material resulting from clearing and grubbing and site preparation operations shall be removed and legally disposed of by the Contractor off the site. Disposal by burning or burying on the site will not be permitted.

END OF SECTION

SECTION 02215

BEDDING FOR PIPES AND STRUCTURES

Part 1 General

1.01 SCOPE OF THE WORK

The work and materials required by this section of the Specifications consist of furnishing all plant, labor, equipment, appliances and materials, and performing all operations in connection with providing bedding for pipes and structures to the details and at the locations indicated and as directed by the Owner, for replacement of unsuitable material where directed by the Owner, and appurtenant work, complete in place and accepted, in accordance with the Drawings and Specifications, and as directed by the Owner. The work shall also include compaction of all bedding and replacement materials; shaping of pipe bedding, after compaction and just prior to laying pipe.

Part 2 Products

2.01 MATERIALS

- A. Fine Gravel shall consist of clean, hard and durable particles or fragments of rock and shall be free from clay, organic matter and other objectionable material. Fine Gravel shall be used for pipe bedding in all areas. Fine gravel shall conform to the following gradation limits:

<u>U.S. Standard Sieve Size</u>	<u>Percentage Passing by Weight</u>
3/4 inch	100
3/8 inch	50-85
No. 4	25-70
No. 10	10-35
No. 40	0-10
No. 100	Less Than 5

Part 3 Execution

3.01 GENERAL

- A. The type of materials required by the drawings shall be used for the work.
- B. Materials shall be provided by the Contractor from sources outside the project limits in the quantities required for completion of the work and shall be approved by the Owner prior to use in the work.

Part 3 Execution - GENERAL cont'd

3.02 WORKMANSHIP

- A. The bottoms of excavations and trenches shall be thoroughly compacted and in approved condition prior to placing the bedding.
- B. The bedding shall be hand placed in layers not exceeding six inches in loose depth and each layer shall be thoroughly compacted, by tamping or other approved method, to the degree of compaction as specified and as approved.
- C. The moisture content of the bedding shall be such that the required compaction shall be obtained. In compacting the bedding, each layer shall be compacted to at least 90 (ninety) percent of maximum dry density at optimum moisture content, as determined in accordance with the requirements of Method D of ASTM Designation: D 1557, latest revision.
- D. The pipe bedding shall be carefully graded and shaped so that the full length of pipe barrel shall have complete and uniform bearing and the bedding compacted in a careful and thorough manner along both sides of pipes to provide proper support and bedding for the pipes. Bell holes and depressions for joints shall be dug after the bedding has been graded and compacted and shall be of a size suitable for the proper jointing of the pipe. The Contractor shall exercise care in all placing and compacting operations so as to prevent disturbing joints, displacement or damage to the pipes.

3.03 INSPECTION

- A. As the work progresses, the pipelines will be checked by the Owner to determine whether any disturbing of joints, displacement or damage to the pipes has occurred. If the inspection of pipelines shows poor alignment, displaced pipe, disturbed joints, damage to pipe or any other defects, the Contractor shall eliminate all deficiencies in a satisfactory manner, at no additional expense to the Owner.
- B. The Owner may make compaction tests as the work progresses to determine the degree of compaction being attained by the Contractor. Any corrective work required as a result of such tests, such as additional compaction or a decrease in the thickness of layers, shall be performed by the Contractor. Compaction control tests will be made at no expense to the Contractor, but the Contractor's assistance will be required for obtaining samples at no additional cost to the Owner.

END OF SECTION

SECTION 02221

TRENCH EXCAVATION, EARTH & BACKFILL

Part 1 General

1.01 SCOPE OF THE WORK

The work and materials required by this section of the Specifications consists of excavating, backfilling, compacting, grading, furnishing and installing fill for embankment areas as indicated or directed, below grade excavation and refills of unsuitable material, and all other incidental work necessary for the construction of pipelines, structures, pavement and appurtenant work in accordance with the drawings, specifications and as directed by the Owner. The work also includes installing shoring and bracing as the excavation proceeds; providing approved earth borrow and bank-run gravel from off-site sources when directed for backfills of excavation and refills of below-grade excavation; excavation and disposal at locations directed by the Owner of pavements, surplus and unsuitable materials; protection of existing pipelines, utilities and structures and of new work; compaction of trench bottom, backfills, refills and subgrades; and all other appurtenant work as required or as directed by the Owner.

1.02 RELATED WORK DESCRIBED ELSEWHERE

- | | | |
|----|--|---------------|
| A. | Dewatering, Control and Diversion of Water | Section 01563 |
| B. | Clearing and Grubbing | Section 02110 |
| C. | Trench Excavation/Rock and Earth Backfill | Section 02211 |
| D. | Bedding for Pipes and Structures | Section 02215 |
| E. | Restoration of Lawns and Right of Way Access | Section 02486 |

Part 2 Products

2.01 MATERIALS

- A. Earth borrow shall be a well-graded granular material, at least 80 (eighty) percent of which must be sand and gravel. It shall be free from peat, organic matter and debris and shall not contain any stones or clay lumps in excess of four inches in their greatest dimensions. Any materials of whatever description which are too uniformly-graded or saturated and not readily compactable shall not be utilized for earth borrow.

Part 2 Products - MATERIALS cont'd

- B. Bank-run gravel shall be composed of a mixture of sand and gravel. It shall be well-graded from the maximum size specified to not more than 10 (ten) percent by weight of silt or clay. It shall be free of peat, vegetable or organic matter, clay lumps and any other debris. The gravel refill shall be readily compactible and shall meet the following requirements:

GRADATION

<u>U.S. Standard Sieve Size</u>	<u>Percentage Passing By Weight</u>
5 inch	100
1/4 inch	30-65
No. 40	5-30
No. 100	0-10

Part 3 Execution

3.01 PROTECTION OF TREES & SHRUBBERY

- A. Existing trees and shrubbery to remain shall be protected from injury. Except as otherwise permitted, cutting and trimming of existing trees will not be permitted.
- B. All existing trees which are to remain and which may be damaged by construction operations shall be boxed and protected as required or directed. All such protection shall be maintained until completion of the work of the contract, unless otherwise directed.

3.02 DISPOSAL OF EXCAVATED MATERIAL

- A. All excavated earth materials approved by the Owner as suitable for reuse shall be used for backfilling excavations, berms and for rough grading as necessary for the completion of the contract work.
- B. All surplus or unsuitable materials, rock from rock excavation and boulders and pavement material shall remain the property of the Owner and shall be removed and satisfactorily disposed of by the Contractor as directed by the Owner at no additional expense to the Owner.

3.03 UNSUITABLE MATERIALS

- A. Unsuitable materials are herein defined as organic material, peat, organic silt or combinations thereof, all having unsuitable in-situ bearing properties and all materials of whatever description which are too loose or saturated for use as backfill to provide satisfactory bearing.

Part 3 Execution - UNSUITABLE MATERIALS cont'd

- B. If unsuitable material is encountered at the depths indicated on the drawings for bottom limit of excavation, the Contractor shall immediately notify the Owner and shall not proceed further until instructions are given.
- C. The Contractor shall satisfactorily excavate and remove all unsuitable material to lines, grades and limits indicated on the drawings or as directed in writing by the Owner and shall satisfactorily dispose of such material off the site.
- D. All resulting excavations below proposed trench depth shall be refilled with compacted bank-run gravel refill.

3.04 EXCAVATION

- A. Earth excavation shall include the excavation, removal and satisfactory disposal of all materials of whatever nature encountered from within the limits indicated or specified or as directed in writing, other than rock or ledge as defined under another Section as "ROCK EXCAVATION".
- B. Excavation shall include but not be limited to earth materials such as peats, or organic or inorganic silts, clay, sand and gravel; pavements; cobbles and boulders less than 1 (one) cubic yard in volume; soft or disintegrated rock which, in the opinion of the Owner, can be removed without blasting or drilling; brick and concrete masonry and all obstructions not specifically included in another Section.
- C. All excavation, sheeting, shoring and dewatering operations shall be accomplished to prevent the undermining or disturbing of existing pipelines, utilities and structures or of any completed construction.
- D. The required excavations are to some extent below existing ground water levels. All excavations shall be kept dry at all times and all construction work shall be performed in the dry, unless otherwise authorized or directed by the Owner.
- E. Excavation shall be made to the lines and grades shown on the drawings or as modified by the Owner. Excavations shall be accurately graded to allow satisfactory construction of the contract work. Immediately after excavation to the indicated or directed trench bottom, the Contractor shall compact the exposed surface with 2 (two) passes of an approved plate-type vibratory compactor.
- F. Bell holes and depressions for joints shall be dug after the trench bottom has been graded and compacted and after gravel bedding, if required, has been placed and compacted. The bottom quadrant of each pipe barrel shall have complete and uniform bearing for the full length of each pipe. The trench bottom shall again be thoroughly compacted just prior to final shaping for bedding and installation of pipe.

Part 3 Execution - EXCAVATION cont'd

- G. Excavation operations adjacent to and below existing structures and utilities shall be done manually and in a manner to prevent disturbance of or damage to the existing structures and utilities. Butt bracing of utility poles shall be utilized where necessary.
- H. Existing pavements and base courses shall be carefully saw cut and removed to obtain sound, vertical edges to the lines indicated. Existing pavements and base courses beyond the indicated lines which are to remain and which have been disturbed or damaged shall be restored or replaced by the Contractor to match existing pavements and base courses, at no additional expense to the Owner. Existing pavements and base courses to remain shall be protected by the Contractor.
- I. The contractor shall be responsible for keeping all excavated and construction material a safe distance back from the edge of excavations to avoid overloading the sides of excavations and to prevent slides or cave-ins.
- J. If an excavation is made deeper or wider than that shown on the drawings, unless directed in writing by the Owner, there will be no extra payment for such unauthorized excavation. Backfill and compaction of all unauthorized excavations shall be made by the Contractor with either selected materials from excavations or from earth borrow, as directed by the Owner and at no expense to the Owner.
- K. If a pipe is to be placed in fill or the top of the pipe is within two feet of existing ground surface, the fill shall first be placed as specified herein to a height of not less than two feet over the top of the pipe and for a width of five feet beyond each side of the pipeline. Following placement of such fill, excavation and backfill shall proceed as specified herein.
- L. All trench excavations over 5'-0" depth shall be performed in vertically sheeted or shored trenches. The Contractor may elect to employ a steel trenching box in lieu of the use of sheeting or shoring. Where permanent sheeting is installed in advance of excavation at the locations indicated on the drawings or directed by the Owner to be left in place, an additional payment width of one foot will be allowed in excess of the payment widths shown on the drawings. The installation, measurement and payment of permanent sheeting shall be made in accordance with the applicable section of these Specifications. At locations where temporary sheeting is indicated or is directed to be used and subject to the approval of the Owner, the Contractor uses instead a trenching box, the Contractor will be allowed an additional payment width of one foot in excess of the payment widths shown on the drawings. The use of a trenching box and the conditions and locations where the same shall be allowed, will be subject to the determination and approval of the Owner. No shoring or steel trenching box shall be used in areas underlain by soft or unsuitable soils.

Part 3 Execution - EXCAVATION cont'd

- M. Where the Contractor elects to use shoring, installed as the excavation progresses, to maintain or otherwise protect the sides of the excavation from cave-ins or loss of ground, no additional payment will be allowed in excess of the payment widths shown on the drawings. Shoring shall be adequately braced to prevent cave-ins or loss of ground, and portions of the shoring or bracing shall be left in place as directed by the Owner to maintain stability as backfilling progresses.
- N. No excessive trench widths will be allowed to avoid the use of sheeting . The trench width at and below a level one foot above the top of the pipe shall not exceed the limit indicated on the drawings for the size pipe being installed, unless otherwise permitted by the Owner.
- O. Where existing subsurface utilities or other facilities adjacent to or crossing through excavation require temporary support or protection, such temporary support or protection shall be satisfactorily provided by the Contractor, at no additional expense to the Owner. All necessary measures shall be taken by the Contractor to prevent lateral movement or settlement of existing facilities or of work in progress.
- P. Grading shall be done as necessary to prevent surface water from flowing into excavations and any water accumulating therein shall be removed by pumping or other approved method. The pipelines shall not, at any time, be used for trench drainage.

3.05 BACKFILLING

- A. Unless directed otherwise by the Owner, excavations shall not be backfilled until all required pipeline tests have been satisfactorily performed and until the work as installed conforms to all requirements specified in these Sections. Each layer of backfill material shall be moistened and compacted in such manner as to permit the proper and desired compaction of the backfill, so that paving of excavated areas can proceed immediately after backfilling is completed.
- B. All excavations shall be backfilled as soon as practicable with approved excavated material. If suitable material as approved by the Owner is not available from the excavations in the quantities required for proper backfilling of excavations, the Contractor shall provide the necessary approved earth borrow for backfilling from off-site sources.
- C. All backfill placed in trenches below a level twelve inches above the top of pipe shall consist of selected backfill, placed in layers not exceeding four inches in loose depths. Selected backfill shall be compactible materials as approved by the Owner, not frozen and free from clods of earth, stones larger than two inches in diameter or unsuitable materials. The selected backfill shall be deposited uniformly on both sides of the pipe and shall be thoroughly compacted by tamping under and on each side of the pipe to provide uniform support around the pipe, free from voids.

Part 3 Execution - BACKFILLING cont'd

- D. The balance of backfill in trenches shall be compactible materials as approved by the Owner, not frozen and without any stones larger than four inches in their greatest dimension. It shall be spread in layers not exceeding twelve inches in loose depth and each layer shall be compacted by at least four passes of an approved plate-type vibratory compactor. All trench backfilling shall be carefully placed to avoid disturbance of new work and of existing utilities or structures. The moisture content of backfill shall be such that proper compaction will be obtained. Puddling of backfill with water will not be permitted.
- E. During filling and backfilling operations, pipelines will be checked by the Owner to determine whether any displacement of the pipe has occurred. If the inspection of the pipelines shows poor alignment, displaced pipe or any other defects, the defects designated by the Owner shall be remedied in a satisfactory manner by the Contractor at no additional expense to the Owner.
- F. Backfilling against masonry or concrete shall only be done when approved. Symmetrical backfill loading adjacent to structures shall be maintained. During backfilling and compacting operations, care shall be exercised so that equipment used will not overload the structures. Backfill adjacent to structures shall be placed in layers not more than nine inches in loose depth and each layer thoroughly compacted with at least 4 (four) passes of an approved plate-type vibratory compactor.
- G. Where it becomes necessary to create an embankment or berm, for reasons including but not limited to placing a pipe in fill or replacing unsuitable material in an existing embankment, approved backfill or earth borrow shall be placed as stipulated by the owner in layers not exceeding twelve inches in loose depth and each layer shall be thoroughly compacted by no less than 4 (four) passes of an approved plate-type vibratory compactor.
- H. After backfilling trenches, the Contractor shall maintain the filled surfaces in good condition, with a smooth surface level with adjacent undisturbed surfaces. Any subsequent settling shall be immediately repaired by the Contractor in a manner satisfactory to the Owner and such maintenance shall be provided by the Contractor for the remainder of this contract, at no additional expense to the Owner.
- I. The finished surfaces of filled excavations shall be compacted, and reasonable smooth and free from surface irregularities. Subgrade upon which either topsoil or pavements is to be placed shall be maintained in a satisfactory condition until the finish courses are placed. The storage or stockpiling of materials on finished subgrade will not be permitted.
- J. Prior to paving upon the subgrade, all soft or unsuitable material shall be removed and replaced with suitable materials from excavation or earth borrow, as approved by the Owner. All low sections, holes or depressions shall be brought to the required grade with material approved by the Owner. The entire subgrade shall be shaped to line, grade and cross section and thoroughly compacted.

Part 3 Execution - BACKFILLING cont'd

- K. The Contractor's attention is directed to the fact that unsuitable materials such as organic material, peat, silt or combinations thereof, having unsuitable bearing properties may be encountered at the depths indicated for excavations; if, as the work progresses, unsuitable material is encountered at and below the depths indicated for excavation, notify the Owner immediately and do not proceed further until instructions are given. Sheeting shall be driven a minimum of two feet below the bottom of unsuitable material prior to its removal. Excavate and remove the unsuitable material in accordance with the applicable requirements specified herein, to the lines, grades and limits directed by the Owner and satisfactorily dispose of the excavated material off the site. The resulting excavations shall be refilled to the grades established for the underside of the bedding for the pipe, as directed with thoroughly compacted bank-run gravel.
- L. The Contractor's attention is directed to the fact that earth fill may be required, to the lines, grades and limits as indicated and as directed by the Owner. The fill shall be as specified as earth borrow.

3.06 PROTECTION OF EXISTING UTILITIES & STRUCTURES

- A. Excavation and backfill operations shall be done in such a manner to prevent cave-in or the undermining, damage or disturbing of existing utilities and structures or of new work. Backfill shall be placed and compacted so as to prevent future settlement or damage to existing utilities and structures and new work.
- B. The Contractor shall be responsible for contacting all utility companies prior to any trench excavations.
- C. Any excavations improperly backfilled or where settlement occurs shall be reopened to the depth required, then refilled with new materials and compacted and the surface restored to the required grade and condition, at no additional expense to the Owner.
- D. Any relief from damage due to excavation, backfilling or settlement of the backfill or injury to persons or damage to property occurring as a result of such damage, shall be the responsibility of the Contractor. All costs to repair such damage, in a manner satisfactory to the Owner, shall be borne by the Contractor at no additional expense to the Owner.

END OF SECTION

SECTION 02270

EROSION CONTROL

Part 1 General

1.01 SCOPE OF WORK

- A. The work required by this Section of the Specifications shall include, but not necessarily be limited to the installation of berms, dikes, dams, netting, gravel, mulches, grasses, slope drains, ditches channels, rip-rap, grading to control runoff, silt fences, baled hay and other erosion control devices. The work shall also include continual maintenance, removal and cleanup of installed erosion control devices, all in accordance with the drawings and specifications and as directed by the Owner.

1.02 RELATED WORK DESCRIBED ELSEWHERE

- | | | |
|----|--|---------------|
| A. | Calcium Chloride | Section 01562 |
| B. | Dewatering, Control and Diversion of Water | Section 01563 |
| C. | Earthwork | Section 02200 |
| D. | Trench Excavation, Rock and Earth Backfill | Section 02211 |
| E. | Trench Excavation, Earth and Backfill | Section 02221 |
| F. | Restoration of Lawns and Rights-of-way Areas | Section 02486 |

Part 2 Products

- A. Mulch shall be of the following materials, or any approved locally available material other than these specified. Mulch material which contains an excessive quantity of matured seed of noxious weeds or other species will not be acceptable. Straw or other mulch material which is fresh and excessively brittle, or which is in such an advanced stage of decomposition as to smother or retard the growth of grass, will not be acceptable.
1. Straw: Straw shall be the threshed straw of oats, wheat, barley, rye, flax beans or peas.
 2. Hay: Hay shall be cured, dried, and shall be of such types as native hay, Sudan-grass hay, broom-sedge hay and grass clippings.

Part 2 Products cont'd

- B. Hay bales shall be made of the types of hay described above and shall have a forty pound minimum weight and one hundred and twenty pound maximum weight. The wood stakes used to secure the hay bales shall be a minimum of 1 (one) inch by 1 (one) inch nominal size by a minimum of 3 feet long.
- C. Filter Fabric shall be non-rotting, acid and alkali resistant and have sufficient strength and permeability for the purpose intended, including handling and backfilling operations. Fibers shall be low water absorbent. The fiber network must be dimensionally stable and resistant to delamination. The fabric shall be free of any chemical treatment or coating that will reduce its permeability. The fabric shall also be free of any flows or defects which will alter its physical properties. Torn or punctured fabrics shall not be used. For each specific use, only commercially available fabric which is certified in writing by the manufacturer for the purpose intended shall be used. The Engineer reserves the right to reject any fabric which he deems unsatisfactory for a specific use. The brand name shall be labeled on the fabric or the fabric container. Fabrics which are susceptible to damage from sunlight or heat shall not be used.
- D. Grass shall conform to the requirements of Section 02819. The seeding may be altered by the Engineer if requested by the Contractor to suit special areas or conditions.
- E. All other materials, not specifically described, but required for adequate erosion control, shall be as selected by the Contractor subject to the approval of the Engineer.

Part 3 Execution

3.01 GENERAL EROSION CONTROL REQUIREMENTS

The Engineer has the authority to control the surface area of each material exposed by construction operations and to direct the Contractor to immediately provide permanent or temporary pollution control measures to prevent contamination of adjacent streams, watercourses, lakes, ponds or other areas of water impoundment. Every effort shall be made by the Contractor to prevent erosion on the site and abutting property. All slopes shall be stabilized by mulching, seeding or otherwise protected as the work progresses to comply with the intent of this specification. All damaged slopes shall be repaired as soon as possible. The Engineer shall limit the surface area of earth material exposed if the Contractor fails to sufficiently protect the slopes to prevent pollution.

The Contractor shall at all times have on hand the necessary materials and equipment to provide or early slope stabilization and corrective measures to damaged slopes.

Temporary channels, ditches and outfalls shall be protected prior to directing water into them to prevent erosion.

The erosion control features installed by the Contractor shall be maintained by the Contractor, and he shall remove such installations if ordered by the Engineer.

Part 3 Execution - GENERAL EROSION CONTROL REQUIREMENT cont'd

The Contractor shall operate all equipment and perform all construction operations so as to minimize pollution. The Contractor shall cease any of his operations which will increase pollution during rain storms.

3.02 HAY BALE INSTALLATION

Bales shall be placed as shown on the plans or as directed by the Engineer. They shall be held in place by two wooden stakes in each bale driven a minimum of 18 (eighteen) inches into the ground. Bales shall be maintained or replaced until they are no longer necessary for the purpose intended or are ordered removed by the Engineer.

3.03 SILT FENCE INSTALLATION

- A. When silt fences are used, the fabric shall be mounted on posts with or without fence backing as recommended by the fabric manufacturer. The bottom six inches of the fabric shall be buried by either trenching, laying the six inch section horizontally across the trench and burying or by laying the six inch section horizontally on the ground and burying by ramping the soil up to the control fence.

The Contractor may use brush as a backing for the filter fabric by piling the brush two to three feet high and then attaching the filter fabric to the brush and burying the bottom six inches of filter fabric as in the previous fence method.

The installation shall be maintained or replaced until they are no longer necessary for the purpose intended or are ordered removed by the Engineer.

The filter fabric fence systems will be completely removed from the project at the project at the completion of the project, unless specifically authorized by the Engineer to be left in place.

3.04 SEEDING

Seeding shall be as described in Section 02486.

3.05 MULCHING

The mulch shall be spread uniformly in a continuous blanket, using 2 (two) tons per acre. The mulch shall be spread by hand or other approved method. Mulching shall be started at the windward side of flat areas, or at the upper part of steel slopes and shall continue uniformly until the area is completely covered.

3.06 EROSION CONTROL DEVICES

- A. On all slopes 3 (three) on 1 (one) steeper, mulch shall be secured to the soil by means of staking and string line, by brush, by a shallow covering of earth or by pressing mulch into the soil at approximately 1 1/2 (one and a half) foot intervals with a spade or other approved tool or by other suitable means.
- B. All erosion control devices such as hay bales, seed and mulch shall be maintained and repaired at regular intervals and after every storm event.
- C. All areas and spots that do not show a prompt "catch" shall be reseeded at intervals of 10 (ten) days until a good growth of grass is established.
- D. All temporary erosion control facilities when ordered by the Engineer shall be removed in a neat and workmanlike manner, and shall also include removal and disposal of accumulated silt.

END OF SECTION

SECTION 02420

STORM DRAINAGE UTILITIES

Part 1 General

1.01 Scope of the Work

- A. The work and materials required by this section of the Specifications consist of furnishing all plant, labor, equipment, appliances and materials, and performing all operations in connection with providing installation of storm drainage piping and structures to the details and at the locations indicated and as directed by the Owner, and appurtenant work, complete in place and accepted, in accordance with the Drawings and Specifications, and as directed by the Owner.

1.02 References

- A. Whenever reference is made to the Form 817 in these Specifications it shall refer to "State of Connecticut Department of Transportation Standard Specifications for Roads, Bridges and Incidental Construction" (Form 817) and its latest supplements and revisions.
- B. When reference is made to a particular section of Form 817, it will be construed to include all related articles referred to in said section.

Part 2 Products

2.01 Materials

A. General

- 1. The Contractor shall furnish and completely install the type and amount of drainage materials as directed by the Owner.

B. HDPE Storm Drainage Piping and Appurtenances

- 1. Materials for High Density Poly Ethylene (HDPE) pipe shall conform to the requirements of Section M.08.01 of Form 817.
- 2. HDPE pipe shall be non-perforated with a smooth interior wall. Pipe shall meet the requirements of AASHTO M 294. Pipe shall be joined by a bell and spigot joint and incorporate a gasket rendering the joint silt-tight.
- 3. Materials for HDPE Flared End Section shall conform to ASTM D-3350 and be of the same materials and manufacturer as the HDPE pipe

C. Catch Basin

- 1. Materials for Catch Basin shall conform to the requirements of Section M.08.02 of Form 817, and the Town of North Haven standard details.

2. Catch Basin shall be precast concrete construction conforming to the requirements of AASHTO M 199 (ASTM C478). Concrete materials shall conform to Section M.03 of Form 817, and reinforcing shall conform to Section M.06.01 of Form 817. All structures shall be designed to support an HS-20 loading. Structure shall be provided with a metal frame and grated inlet.

Part 3 Execution

3.01 General

- A. The type of materials required by the drawings shall be used for the work.
- B. Materials shall be provided by the Contractor from sources outside the project limits in the quantities required for completion of the work and shall be approved by the Owner prior to use in the work.

3.02 Pipe and Pipe Joint Construction

- A. Join pipe and fitting in accordance with the manufacturers recommendations
- B. Pipe installation shall conform with Section 6.51.03 of Form 817

3.03 Catch Basin Construction

- A. Catch basin installation shall conform with Section 5.07.03 of Form 817

END OF SECTION

SECTION 02486

RESTORATION OF LAWNS & RIGHT OF WAY AREAS

Part 1 General

1.01 SCOPE OF THE WORK

- A. The work required by this section of the Specifications consists of the furnishing of all plant, labor, equipment, appliances and materials, and in performing all operations in connection with lawn and landscape restoration associated with construction activities through established and maintained lawns; landscaped areas; or any developed, planted or partially cleared forested areas, complete in accordance with the Specifications, the drawings, and as directed by the Owner.
- B. The work shall also include stripping; stockpiling; hauling, handling and rehandling of topsoil; and protection of stockpiled topsoil; preparation of subgrades; spreading, compacting, grading and replacing deficiencies in quantities of topsoil; protection of completed topsoiled areas; raking, rolled, seeding, watering and maintenance of all seeded areas, and all other work incidental and necessary for the satisfactory completion of the work included under this section of the Specifications.
- C. All work required by this section of the Specifications shall be performed immediately following trench backfilling operations or as soon thereafter as weather conditions will allow through each individual lot except as limited by paragraph 1.03 of these Specifications. If this work is not performed as stated above or as directed by the Owner, the Owner may order the work done by others and the cost of said work shall be charged to the Contractor.

1.02 RELATED WORK DESCRIBED ELSEWHERE

- | | | |
|----|---|---------------|
| A. | Trench Excavation/Rock and Earth Backfill | Section 02211 |
| B. | Trench Excavation/Earth and Backfill | Section 02221 |

1.03 PLANTING SEASON

The sowing of seed shall be done only within the season extending from April 5th to May 25th and August 25th to September 25th, except at such times therein as the Owner may deem inadvisable because of weather or other conditions, and except as otherwise herein specified. In the event that seasonal and other conditions permit, and upon approval of the Owner seeding may start earlier and/or be continued later than specified dates. The sowing of seed shall be started on all areas during the first planting season after the areas have been released to the Contractor for lawn operations.

Part 1 General - PLANTING SEASON cont'd

The preparation of lawn areas shall not start until immediately preceding the season for seeding, except that topsoil may be spread at the option of the Contractor, provided that it be thoroughly loosened to its full depth and brought to a friable, mellow condition before the seed bed is further prepared.

1.04 PROTECTION OF TREES

- A. All trees, except those approved by the Owner to be removed for construction, which are subject to damage in conjunction with this contract shall be protected by wood planking, wrapping or whatever means which might become necessary or as directed by the Owner. Any tree to be removed and replaced after construction shall be bagged, balled, stored, and maintained in a safe condition, pending replanting. One (1) year guarantee will commence from the day of replanting.
- B. No backfill of any nature shall be placed by the Contractor above the root spread of a tree or plant which it is desired to preserve until a fill of porous material not less than three inches in depth, or as directed by the Owner and a mulch layer have first been placed above its roots.
- C. Where tree root protection is ordered, the area to be protected shall be thoroughly cleaned of all vegetation. Porous material shall then be spread loosely over the area to a depth ranging from three to twelve inches. On top of the porous material, a mulch layer shall be spread, over which a layer of fill material acceptable to the Owner shall be placed.
- D. Care shall be taken that trees or shrubs which are to be preserved in place are not scarred or damaged by the operations under this item. The root area to be protected shall be the area of ground surface lying within the periphery of the tree or as directed by the Owner.

1.05 ESTABLISHMENT

- A. At all times adequate protection shall be provided for all restored areas against trespassing or damage by others. The moving of heavy equipment or materials over the restored areas shall be avoided as far as possible, but if necessary, must be done on planks.
- B. The Contractor shall properly care for all lawn areas by watering, weeding, mowing, rolling, trimming and edging and by performing any other necessary operations of maintenance. All areas and spots that do not show a prompt "catch" shall be reseeded at intervals of 10 (ten) days which shall continue until a good growth of grass is established over the entire restoration area. The methods pursued in the renewal or replacement of disturbed areas shall be as specified.

Part 1 General - ESTABLISHMENT cont'd

Maintenance shall immediately follow the accomplishment of planting operations as applied to any planting or, the accomplishment of any other unit of work so specified and shall continue on all work for a period of sixty days after the close of the planting season as specified, during which the last planting operations or lawn operations were accomplished and if necessary shall continue further until the requirements of the above are fulfilled. No requirements of this specification shall be interpreted to relieve the Contractor of the responsibility of maintenance as outlined.

1.06 GUARANTEE & REPLACEMENT

- A. The Owner will not accept lawn areas until the completion of all the work required under this project.
- B. Seeded areas shall be guaranteed for a period of 1 (one) year after acceptance by the Owner and shall be alive and in satisfactory growth at the end of the guarantee period.

Part 2 Products

2.01 MATERIALS

- A. All topsoil needed to complete the work shall be provided by the Contractor by processing topsoil obtained in stripping and stockpiling operations during construction at the site; and/or obtained from an approved source off the site at no additional cost to the Owner. The topsoil shall be natural, friable soil possessing characteristics of the topsoils of the vicinity which produce heavy growth of crops, grass or other vegetation and shall be light to dark brown in color. Before the soil is used, it shall be reasonable free from subsoil, clay, lumps, stones, roots and similar objects, any of which are larger than one inch in diameter, brush, objectionable weeds or other litter, excess acid or alkali or any other material or substance which may be harmful to plant growth or a hindrance to grading and maintenance operations.
- B. Commercial fertilizer shall be a complete fertilizer with 30 (thirty) to 40 (forty) percent of the nitrogen derived from natural organic sources and containing in available form by weight 8 (eight) percent nitrogen, 6 (six) percent phosphoric acid and 4 (four) percent potash. The commercial fertilizer shall be delivered to the site in the original unopened containers which shall bear the guaranteed statement of analysis of the manufacturer.
- C. Lime shall be ground, dolomitic, agricultural limestone and shall contain a minimum of 85 (eighty-five) percent total carbonates. It shall be ground to a fineness so that 80 (eighty) percent will pass through a No. 100 (one hundred) sieve and 95 (ninety-five) percent through a No. 60 (sixty) sieve. A certificate from a reputable producer of ground, dolomitic agricultural limestone attesting that his product meets the above specifications shall be submitted by the Contractor.

Part 2 Products - MATERIALS cont'd

- D. Lawn seed shall be fresh, clean, new crop seed. Seed may be mixed by an approved method on the site or may be mixed by the dealer. If the seed is mixed on the site, each variety shall be delivered in the original containers which shall bear the guaranteed analysis of the dealer. If the seed is mixed by the dealer, the Contractor shall furnish to the Owner the guaranteed statement of the dealer of the composition of the mixture and percentages of purity and germination of each variety. Grass seed for the areas to be seeded shall be composed of the following seeds mixed in the proportions by weight and testing the minimum percentages of purity and germination as indicated herein.

<u>Type of Seed</u>	<u>Proportion by Weight Percent</u>	<u>Percent of Purity</u>	<u>Percent Germination</u>
1. <u>Lawn or Developed Areas</u>			
Penn Lawn Chewings Fescue	40	95	88
Pennstar Bluegrass	25	95	90
Merion Bluegrass	25	95	90
Perennial Ryegrass	10	98	90
2. <u>Field or Partially Cleared Forested Areas</u>			
Alsike Clover	5	98	85
Creeping Red Fescue	45	98	85
Kentucky 31 Fescue	30	98	85
Perennial Rye	20	95	90

- E. Mulch shall be of any of the following material, or any approved locally available material other than these specified. Mulch material which contains an excessive quantity of matured seed of noxious weeds or other species will not be acceptable. Straw or other mulch material which is fresh and excessively brittle, or which is in such an advanced stage of decomposition as to smother or retard the growth of grass, will not be acceptable.
1. Straw: Straw shall be the threshed straw of oats, wheat, barley, rye, flax beans or peas.
 2. Hay: Hay shall be cured, dried, and shall be of such types as native hay, Sudan-grass hay, broom-sedge hay, and grass clippings.

Part 3

3.01 STRIPPING, STOCKPILING & REPLACING TOPSOIL

- A. On any part of the work crossing developed lawn areas, the grass sod shall be removed and stored during the construction operation and replaced as specified herein and/or as directed by the Owner.
- B. Topsoil shall be carefully removed to the depths and within the limits directed for removal and replacing of topsoil. Topsoil shall be transported and deposited in storage piles in approved locations convenient to the areas from which it is removed. the topsoil shall be stockpiled separate from other excavated materials and free of roots, stones and other undesirable material. The Contractor shall take all necessary precautions to prevent other excavated materials or objectionable materials from becoming intermixed with topsoil during any operations. Stripping operation shall be completed prior to excavation, filling, compacting, or grading operations.
- C. Stockpiles shall be neatly trimmed and graded to provide drainage from surfaces and to prevent depressions where water may become impounded. After being trimmed and graded, stockpiles shall be protected and shall not be disturbed except for subsequent reuse of topsoil.
- D. Certain grading requirements for establishing the subgrade for restored areas are specified and included herein under sections as listed in paragraph 1.02; these requirements include all cutting, filling, backfilling, embankments and grading necessary to bring the subgrade of all grassed areas to a depth of not less than 6 (six) inches below the proposed finished grades as indicated and/or as directed by the Owner.
- E. Prior to placing the topsoil, the Contractor shall prepare to subgrade the areas as specified herein. Areas upon which topsoil is to be placed shall be cleared of all vegetations, stones and roots larger than one inch in diameter, brush, sticks and any other material which might hinder proper grading or tillage operations which might interfere with or be harmful to plant growth.
- F. The subgrade of all areas on which topsoil is to be placed shall be brought to the elevation required to provide for the placement to the depth specified. All filling, excavation and grading shall be done to provide the subgrade at the proper elevation free of depressions or irregularities.
- G. After subgrades of the areas have been satisfactorily brought to the proper condition, elevations and contours, and immediately prior to placing and spreading the topsoil, the subgrade shall be loosened by discing, scarifying or other approved method, to a depth of approximately 3 (three) inches to permit bonding of the topsoil to the subgrade.

Part 3 STRIPPING, STOCKPILING & REPLACING TOPSOIL cont'd

- H. Topsoil shall be placed only when seeding can follow within a reasonable time. The topsoil shall be uniformly distributed and compacted on the areas designated to be seeded in sufficient depth to compensate for any shrinkage. The average thickness of the compacted topsoil shall be not less than 4 (four) inches. The surfaces of the areas shall finish evenly with adjacent undisturbed surfaces. They shall be rolled with a hand roller weighing not more than 100 (one hundred) pounds per foot of width. During the rolling, all depressions caused by settlement or rolling shall be filled with additional topsoil and the surfaces shall be regraded and rolled until they present a smooth and uniform finish free from depressions where water will stand and with all surfaces at the required grade. Topsoil shall not be placed when the topsoil or subgrade is frozen, excessively wet, extremely dry or in a condition which would be detrimental to the operations. All areas shall be protected and maintained in a proper and satisfactory conditions until they are fertilized and seeded.

3.02 SEEDING

- A. Before starting work, approved types of equipment shall be on hand and it shall be demonstrated that the application of lime, fertilizer and seed will be made at the specified rates.
- B. Lawn grass mix as specified herein, shall be used for seeding in all existing lawn areas disturbed by this construction. All other disturbed areas unless otherwise superseded by previous right of way easement agreements shall be seeded with field grass mix, as specified herein.
- C. The seed bed shall be brought to the required finished grades, free from ridges and depressions, through successive stages of light rolling, fine grading and ranking operations. The surfaces shall be cleared of all objectionable weeds and shall be free from stone, roots or objects larger than one inch in diameter and other material which would be a hindrance to planting operations or to plant growth. A finely textured seed bed shall be obtained.
- D. Lime shall be spread uniformly over the areas to be seeded at a rate of 2,000 (two-thousand) pounds per acre. Fertilizer shall be spread uniformly over the areas to be seeded at a rate of 900 (nine-hundred) pounds per acre. Each material shall be worked independently into the top 3 (three) inches of soil by discing, harrowing or other acceptable methods. Sticks, stones and debris shall be removed from the areas and satisfactorily disposed of .

Part 3 SEEDING cont'd

- E. After the areas to be seeded have been prepared as specified herein, the specified seed mixture shall be uniformly sown thereon at a rate of 4 (four) pounds per 1,000 (one-thousand) square feet. Hand seeders, power-drawn drills or other approved equipment shall be used. After sowing, the seed shall be lightly covered and the seeded areas compacted by rolling.

All seeding shall be done only at times approved by the Owner.

No seeding shall be permitted after a rain unless the surface of the ground is loosened or when the velocity of the wind exceeds a gentle breeze or about five miles an hour. Extreme care shall be exercised during seeding and raking so that no change in grade is made and so that the seed is not raked from one spot to another.

3.03 MULCHING

- A. The mulch shall be spread uniformly in a continuous blanket, using 2 (two) tons per acre. If the mulching material is too long and brittle for proper spreading, it shall be cut to length of not less than 8 (eight) inches and watered as needed before spreading. The mulch shall be spread by hand or other approved methods. Mulching shall be started at the windward side of flat areas, or at the upper part of steep slopes and shall continue uniformly until the area is completely covered.
- B. On all slopes 3 (three) or 1 (one) or steeper, mulch shall be secured to the soil by means of staking and string line, by brush, by a shallow covering of earth or by pressing mulch into the soil at approximately 1 1/2 (one and one-half) foot intervals with a spade or other approved tool or by other suitable means which will not be detrimental to subsequent maintenance.

END OF SECTION

SECTION 02553

PERMANENT PAVEMENT

Part 1 General

1.01 SCOPE OF WORK

The work and materials required by this section of the Specifications consist of the following:

1. Saw cutting bituminous concrete pavement required to be removed and where matching existing.
2. Excavation and disposal off-site of the pavement and portion of roadway base as necessary to perform the work indicated on the plans, to the limits shown on the details or as directed by the Owner.
3. Furnishing, placing and compacting sub-base material.
4. Furnishing, placing and compacting the surface course as required.
5. Furnish and apply bituminous tack coats.
6. Provide traffic control, signs, barriers and detours required.
7. Notify appropriate municipal and state officials.
8. Secure all necessary permits and approvals.

1.02 REFERENCES

- A. Whenever reference is made to the Form 817 in these Specifications, it shall refer to "State of Connecticut Department of Transportation Standard Specifications for Roads, Bridges and Incidental Construction, Form 817, and its latest supplements and revisions.
- B. When reference is made to a particular section of Form 817, it will be construed to include all related articles referred to in said section.

Part 2 Products

2.01 MATERIALS

A. General

1. The Contractor shall furnish and completely install the type and amount of roadway materials indicated on the drawings or as directed by the Owner in writing.
2. The Contractor shall promptly furnish the Owner with the required material tests and analysis results and shall readily enable the Owner's representative to perform any required on-site tests.

B. Surface Course Materials

1. Bituminous material for tack coat shall conform to the requirements of Section M.04 of Form 817.
2. The materials for permanent pavement replacement shall conform to the requirements of Section M.04 and mixture shall be HMA S0.375" of Form 817.
3. The base course shall consist of processed gravel conforming to the material requirements of Section M.02.03 of Form 817.

Part 3 Execution

3.01 WORKMANSHIP

- A. Prior to the Construction of the permanent bituminous concrete pavement and as part of the work included under permanent pavements, the temporary bituminous concrete pavement surface course shall be removed in its entirety and the processed gravel base course and earth shall be removed to the depth necessary for the construction of the applicable pavements and sub-base, as specified herein, and as shown on the Drawings. The Contractor shall satisfactorily dispose of all temporary pavement materials and portions of backfill material and earth which are removed and shall at all times maintain the adjacent areas clean and free of materials resulting from removal operations.
- B. The edges of existing pavements to receive permanent pavement shall be saw cut along even lines and shall be cut back 12 (twelve) inches to obtain clean, sound, vertical edges of the original pavement; edges of bituminous material for proper bonding of new pavement construction with the existing pavements.

Part 3 Execution - WORKMANSHIP cont'd

- C. The removal of the top portion of and the placing and finish grading of the processed gravel base shall be performed by hand and/or mechanical methods in such a manner that the portion of the compacted backfill to remain will not be disturbed. All grading, compacting, finishing, and appurtenant work shall be provided as necessary to provide the sub-base in an approved condition for the construction of the succeeding bituminous concrete surface courses. The Construction method shall conform to Section 3.04.03 - Rolled Gravel Base of Form 817. The Contractor shall be responsible for providing all measures and work necessary for protecting and maintaining the sub-base in an approved condition until the succeeding courses of permanent pavements are constructed thereon.
- D. All existing roadway pavements removed for purposes of construction of the work of this Contract shall be replaced; replacement of pavements shall be provided to the details indicated and as specified herein. Existing pavements, outside of the limits of pavement indicated for replacement of pavements, which are to remain and which are damaged as a result of the Contractor's operations in the performance of the work under this Contract shall be replaced, including processed gravel base, bituminous tack coats and surface courses by the Contractor in accordance with the requirements specified herein in a manner satisfactory and at no additional expense to the Owner.
- E. The Contractor shall place two 1-1/2 (one-and-one half) inch thick bituminous concrete HMA S0.375" (one) surface courses for permanent pavement replacement. Bituminous concrete shall be placed to the dimensions shown on the detail plan and as specified by the Engineer. The pavement construction methods shall conform with Article 4.06.03 of Form 817.
- F. Bituminous concrete for permanent pavement replacement shall be placed and compacted with a power roller weighing at least 10 (ten) tons or with an equivalent vibratory roller until thoroughly compacted to a firm and uniform surface satisfactory to the Owner.
- G. Pavement materials shall be laid only when the surface is free of frost and when the weather is not foggy or rainy and further these operations shall be carried out only when the atmospheric temperature is not less than 50 (fifty) degrees F° in the shade.
- H. Finished pavement shall be such that it will not vary more than one-quarter 1/4 (one-quarter) inch from a 10 (ten) foot straight edge applied parallel with the center line of the pavement. Any irregularity of the surface exceeding the above limits shall be corrected. Depressions which may develop after initial rolling shall be remedied by loosening the surface mixture laid and adding new material to bring such depressions to true surface.
- I. No work shall be started on the specific project nor will any mixture be accepted therefor until the Contractor has submitted and received approval of his intended pavement mix formulas, indicating in writing the single definite percentages of each sieve fraction of aggregate; for bitumen which he chooses as the fixed means in each instance, and also the intended temperature taken as it is dumped from the mixer.

Part 3 Execution - WORKMANSHIP cont'd

- J. New pavement shall extend to existing pavement where indicated on the Drawings or as required, with all joints cut clean and straight. All pavement cut for trenches shall be saw cut. All joints shall be properly sealed.

3.02 ADDITIONAL CONTRACTOR RESPONSIBILITIES

- A. The responsibility of the Contractor to obtain from the controlling State and municipal authorities all required permits for the work of placement of pavements in accordance with all customs and requirements of the controlling authorities, in addition to those specified herein at no additional expense to the Owner.
- B. All street fixtures and such other appurtenant work damaged or displaced as a result of the Contractor's operations shall be repaired or replaced and restored by the Contractor in a manner satisfactory to the Owner and to the proper State or municipal officials as the case may be, at no additional expense to the Owner.
- C. In case of settlement or other defects in pavement replacement the Contractor shall cut out, replace, restore or repair the damaged pavements in a manner satisfactory to the Owner at no additional expense to the Owner. This Contract will not be considered as complete until the replacement, restoration and repairs of pavements have been provided in a manner satisfactory to the Owner and in accordance with the requirements specified herein.
- D. Construction of permanent pavement shall be deferred for a period of one freeze/thaw cycle after the completion of the construction of the temporary bituminous pavement surfaces specified, unless otherwise directed in writing by the Owner.
- E. The Contractor shall provide a 2 (two) year maintenance bond guarantee for all pavement after acceptance by the Owner.

END OF SECTION